CLAIMS

1.   A method for determining a score characteristic of a definition of a digital image, comprising:

cumulating quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image to determine a cumulated total; and

choosing the pixels for the cumulating step at least according to a comparison of a first maximum luminance threshold to adjacent pixels in a concerned direction.

2.   The method of claim 1 wherein said score is obtained by dividing the cumulated total by the number of cumulated quadratic norms.

3.   The method of claim 1, wherein the choosing step includes selecting a current pixel having a vertical or horizontal gradient to be taken into account in the cumulated total only if the luminances of two pixels distant from the current pixel by a predetermined interval in the concerned direction are smaller than said first maximum luminance threshold.

4.   The method of claim 3 wherein said first maximum luminance threshold is chosen according to an expected luminosity of possible specular spots which are desired not to be taken into account.

5.   The method of claim 3 wherein the interval is chosen according to the expected size of possible specular spots which are desired not to be taken into account.

17

6.   The method of claim 1 wherein the quadratic norm of a gradient is taken into account in the cumulated total only if its value is smaller than a predetermined gradient threshold.

7.   The method of claim 6 wherein the gradient threshold is chosen according to image contrast.

8.   The method of claim 1 wherein a current pixel is selected to be taken into account in the cumulated total only if its luminance is smaller than a second maximum luminance threshold.

9.   The method of claim 8 wherein the second maximum luminance threshold is chosen to be greater than an expected light intensity of a characteristic element contained in the digital image.

10.   The method of claim 9 wherein said element is an iris of an eye.

11.   The method of claim 1 wherein the image is an eye image.

12.   The method of claim 1, further comprising applying the cumulating and choosing steps to one or several images of a set of digital images representing a same object.

13.   The method of claim 12, further comprising performing an approximate definition test on the images of the set based on cumulating of gradients in a single direction of the light intensities of the image pixels and performing the steps of cumulating the quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image and choosing the pixels only on the images in the set which have successfully passed the approximate definition test.

14.   The method of claim 12 wherein the cumulated total of each image is used to select the clearest image from said set.

15.   A system for determining the definition of a digital image, comprising:

means forcumulating quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image to determine a cumulated total; and

means for choosing the pixels for the cumulating means at least according to a comparison of a first maximum luminance threshold to adjacent pixels in a concerned direction.

16.   A method for determining a score characteristic of a definition of a digital image, comprising:

cumulating quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image to determine a cumulated total; and

choosing the pixels for the cumulating step at least according to a comparison of a maximum gradient threshold to the horizontal and vertical gradients.

17.   The method of claim 16 wherein said score is obtained by dividing the cumulated total by the number of cumulated quadratic norms.

18.   The method of claim 16, wherein the choosing step includes selecting a current pixel having a vertical and horizontal gradient to be taken into account in the cumulated total only if the luminances of two pixels distant from the current pixel by a predetermined interval in a concerned direction are smaller than a maximum luminance threshold.

19.   The method of claim 16 wherein a current pixel is selected to be taken into account in the cumulated total only if its luminance is smaller than a maximum luminance threshold.

20.   The method of claim 16 wherein the image is an eye image.

21.   The method of claim 16, further comprising applying the cumulating and choosing steps to one or several images of a set of digital images representing a same object.

22.   The method of claim 21, further comprising performing an approximate definition test on the images of the set based on cumulating of gradients in a single direction of the light intensities of the image pixels and performing the steps of cumulating the quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image and choosing the pixels only on the images in the set which have successfully passed the approximate definition test.

23.   The method of claim 16, wherein the image is a sub-set of an eye image that is obtained by determining a location of a pupil of the eye image and eliminating from the eye image all pixels that are not within a predetermined vertical distance from the location of the pupil.

24.   The method of claim 23 wherein determining the location of the pupil includes:

eliminating some pixels from the eye image to create a reduced image;

determining an average luminance of each of a plurality of blocks of the reduced image;

determining which of the blocks has the lowest average luminance;

determining a location of the block with the lowest average luminance as the location of the pupil.

25. A method for determining a score characteristic of a definition of a digital image of an eye, comprising:

determining an average luminance of each of a plurality of blocks of the eye image;

determining which of the blocks has the lowest average luminance;

determining a location of the block with the lowest average luminance as a location of a pupil of the eye in the eye image;

eliminating from the eye image all pixels that are not within a predetermined vertical distance from the location of the pupil; and

cumulating quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image to determine a cumulated total.

26. The method of claim 25 wherein said score is obtained by dividing the cumulated total by the number of cumulated quadratic norms.

27. The method of claim 25, further comprising choosing the pixels for the cumulating step by selecting a current pixel having a vertical and horizontal gradient to be taken into account in the cumulated total only if the luminances of two pixels distant from the current pixel by a predetermined interval in a concerned direction are smaller than a maximum luminance threshold.

28. The method of claim 25 wherein a current pixel is selected to be taken into account in the cumulated total only if its luminance is smaller than a maximum luminance threshold.

29. The method of claim 16, further comprising applying the determining steps and the eliminating and cumulating steps to one or several images of a set of digital images representing the eye.

30. The method of claim 21, further comprising performing an approximate definition test on the images of the set based on cumulating of gradients in a single direction of the light intensities of the image pixels and performing the step of cumulating the quadratic norms of horizontal and vertical gradients of luminance values of pixels of the image only on the images in the set which have successfully passed the approximate definition test.